

Remarks

Currently pending are claims 6-10, 12, and 15-24, of which claim 6 is independent.

Objections

Claim 18 stands objected to because an amendment to claim 1 from which it depended deleted a group of polymers and substituted a single “polymer”. Claim 18 has now been amended to depend from claim 6. However, claim 6 also claims a single polymer. Accordingly, claim 18 has been amended to recite a “polymer” and to delete “a group selected from polymer of the coating.”

35 U.S.C. §112

Claim 17 stands rejected under section 112. The claim has been amended to delete the word “all”. Support for one of the functional groups, or a combination of the functional groups that is less than all of the functional groups combined, with the epoxy groups is supported in the original application. The amendment to claim 17 is supported in the original description at page 8, line 35 through page 9, line 9.

Claim 19 stands rejected under section 112. The amended claim 19 filed herewith adopts the Examiner’s suggestions for proper alternative recitation of element X. The recitation of “namely” in line 10 has been corrected by reciting “methyl ethyl and propyl” in new dependent claim 24.

35 U.S.C. §102

Claim 11 was rejected under section 102(e). Claim 11 is cancelled.

Claims 1-5, 12, 15, 17, and 20-21 stand rejected under 102(b). Claims 1-3 are cancelled. Claims 4 and 5 are cancelled and their subject matter is added as new dependent claims 22 and 23, so that they may depend from claim 6. Similarly claims 12, 15, 17 and 21-24 all now depend from claim 6.

35 U.S.C. §103

Claims 6-10, 16 and 18-19 all stand rejected under 35 U.S.C. §103(a) over Roseboom et al. in view of Garnier et al. The rejection is based on the premise that one having ordinary skill in the art would have been motivated to incorporate the adhesion promotor structure taught by Garnier into the polymer coupling agent taught by Roseboom to improve adhesion between the metal and the rubber, because Roseboom already teaches the use of “spacers” between the matrix polymer and Roseboom’s (co)vulcanizable groups and/or chelating groups. Applicant respectfully disagrees.

There is no motivation to introduce the adhesion promoter taught by Garnier into the adhesive polymer taught by Roseboom instead of the “spacer”. First of all, spacers usually are simply chains used to locally space apart functional groups from the backbone. This is not the same function as that of an adhesion promotor. The functional groups of the adhesion promotor are meant to adhere to the metal on one side and to co-polymerize with the rubber on the other side (according to Garnier, not to the invention). Therefore, this adhesion promotor cannot simply be spaced between the chelating group and the matrix polymer of Roseboom’s adhesive polymer.

Moreover, there is no motivation to use the adhesion promotor as a spacer. Both Garnier as well as Roseboom, teach excellent adhesion to a metal surface. This is achieved according to Garnier with an adhesion promotor that is cost effective, because it can be used in a mono-layer. The adhesion promotor allows excellent adhesion and improves corrosion resistance and durability at the same time.

The object of the present invention in view of this state of the art is given in the description under “background of the invention.” It includes the improvement of resistance to dynamic loads and shear forces acting across the interface. With the invention there is created a “soft interface” where the module jump between two totally different materials is smeared.

Roseboom teaches a specific adhesive polymer with chelating groups on one hand for adhesion on the metal surface and groups co-polymerizable with the rubber to be reinforced by the metal reinforcement element. This adhesive polymer could possibly smear shear forces, but has to be tailored individually for the specific adhesion problem.

In contrast to that the invention teaches an adhesion system where two different components—the adhesion promoter and the functionalized polymer—can be selected and combined depending upon the properties to be achieved. This solution cannot be obtained by simply introducing the teaching of Garnier into the teaching of Roseboom (which is not possible, as shown above).

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,



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